OPI DATE 21/11/94 APPLN. ID 65332/94
AOJP DATE 05/01/95 PCT NUMBER PCT/CA94/00203
AU9465332

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 5 : B62J 1/00 — A2

(11) International Publication Number: WO 94/25331

(43) International Publication Date: 10 November 1994 (10.11.94)

(21) International Application Number: PCT/CA94/00203

(22) International Filing Date: 27 April 1994 (27.04.94)

(30) Priority Data:
2,095,055 28 April 1993 (28.04.93) CA

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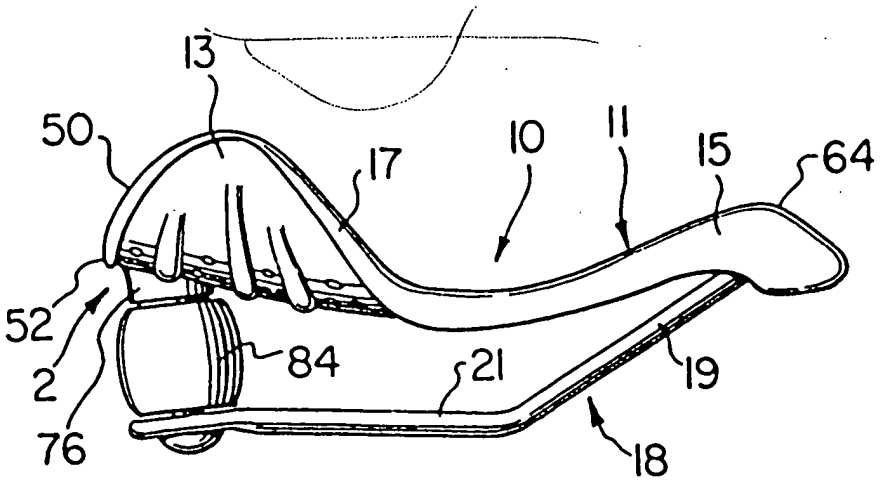
(81) Designated States: AT, AU, BB, BG, BR, BY, CH, CN, CZ, DE, DK, ES, FI, GB, GE, HU, JP, KG, KP, KR, KZ, LK, LU, LV, MD, MG, MN, MW, NL, NO, NZ, PL, PT, RO, RU, SD, SE, SI, SK, TJ, TT, UA, US, UZ, VN, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).

Published
Without international search report and to be republished upon receipt of that report.

(54) Title: SEATING ARRANGEMENTS FOR CYCLES, EXERCICE CYCLES, OTHER PEDAL-POWERED CONTRIVANCES AND THE LIKE CONTRIVANCES

(57) Abstract

A seating arrangement for a cycle or the like has a seat comprising a unitary saddle member (11) having a medial portion (14) with a support member attached to its underside for attaching it to a seat post. The support member may comprise a wire support (18). A pair of symmetrical wing portions (12, 13) extend laterally from the medial portion (14) and a nose portion (15) extends laterally from the medial portion (14) and a nose portion (15) extends forwardly from it. The wing portions (12, 13) are supported as cantilevers and curve outwards and upwards from the medial portion (14), preferably until their distal ends are at least 1.5 cm to 2.5 cm higher than the medial portion. Each wing portion (12, 13) is resiliently flexible to assume a substantially horizontal position under the weight of a rider. The leading edge (16, 17) of each wing portion (12, 13) may be swept back. Such wing portions (12, 13) provide for a greater degree of comfort because they do not concentrate the weight of the rider in one localized area, absorb vibration, and do not significantly inhibit movement of the lower buttocks and upper back of thighs as the rider pedals. In preferred embodiments, the seat is combined with a shock-absorbing seat post assembly comprising a shaft mounted telescopically in a tube and having a keyway extending longitudinally of the shaft between a first position within the end of the tube and a second position nearer the seat supporting end. A key located in the keyway engages the tube and limits rotation of the seat post while permitting reciprocating movement of the seat post relative to the tube.



TITLE OF THE INVENTION

SEATING ARRANGEMENTS FOR CYCLES, EXERCISE CYCLES, OTHER PEDAL-POWERED CONTRIVANCES AND THE LIKE CONTRIVANCES

FIELD OF THE INVENTION

The invention relates to seating arrangements of cycles and other pedal-powered contrivances, including exercise machines, and to motor powered vehicles such as mo-peds and power boats.

BACKGROUND OF THE INVENTION

Traditional cycle seating systems, such as are used on touring cycles, are elongate and thin so as not to impede the pedalling action. Because they support only a small area of the rider's anatomy, are relatively inflexible, and are fastened to the cycle frame with a rigid seta post, they can be uncomfortable, especially when the cycle is travelling upon uneven terrain. Even paved surfaces are not particularly smooth and cyclists who cycle long distances often complain of numbness. For cycles used on unpaved surfaces, such as so-called all terrain cycles or "mountain bikes", a greater degree of resilience is desirable.

There are, of course, other sources of discomfort. In particular, friction can cause chafing and soreness. Although some cyclists often wear special shorts with crotch areas lined with chamois leather or foam rubber in order to reduce such friction and the associated discomfort, it is desirable to address the problem by improved design of the seating arrangement.

PRIOR ART

Various measures have been taken for cushioning the rider from vibrations due to poor road surfaces, including the conventional sprung undercarriage which uses coil springs. U.S. Patent 4,369,998, issued January 25, 1983 to Robert C. Golden et al, discloses an alternative form of undercarriage which comprises two independent torsionally flexible loop systems each incorporating a curved wire loop portion which deflects resiliently under load. The undercarriage is quite complex and requires a seat to be formed upon it, so it is not particularly inexpensive to produce. Moreover, a padded seat is formed around the wire undercarriage, the resulting shape being convex. Consequently, lateral forces will bear against the insides of the rider's thighs and the sphincter muscles, causing localized pressure and early discomfort.

U.S. Patent 4,063,775, issued December 20, 1977 to Robert H. Messinger also discloses an undercarriage or support unit. Messinger discloses a unitary, moulded cycle seat support unit which is said to be flexible in the seat member area in response to the demands of the rider. The support must be used with a padded seat cover. The finished seat has a relatively long nose portion which is undesirable since it is likely to chafe the inside of the rider's thighs. Also, the flexibility of the support unit is limited to the frontal parts of the cheek-supporting portions, which are of reduced thickness. The rear of the seat is supported by relatively rigid ribs so that it does not flex.

Again, U.S. Patent 4,773,705, issued September 27, 1988 to Joseph M. Terranova, discloses a bicycle seat comprising an undercarriage formed by frame members in the form of metal rods supporting a seat which is contoured to conform to the buttocks of the rider. Terranova states that the seat member is formed of substantially rigid

material. He states that his seat provides greater comfort because it does not concentrate the weight of the rider in one small area. It does not address the problem of absorbing shocks due to uneven road surfaces.

U.S. Patent 4,572,575, issued February 25, 1986 to Golden et al, discloses a seat that is generally disc-shaped and has a lateral width sufficient to extend beneath, and support the rider's rump. The seat has peripheral lips and dished cheek-supporting regions so that it conforms to the anatomy of the rider. This shape of seat is said to give improved comfort because it distributes the rider's weight and also makes it easier for a partially dislodged rider to regain a stable seating position. It is not entirely satisfactory, however, for absorbing shocks due to uneven road surfaces. The centre of the seat is raised slightly relative to the cheek-supporting regions which could lead to discomfort due to localized pressure. Also, the peripheral lip extends completely across the rear of the seat and as such acts as a stiffener, limiting flexing of the seat.

Shocks caused by uneven road surfaces can, of course, be absorbed by a shock-absorbing seat post. An example of the many U.S. patents which disclose shock-absorbing seat posts is U.S. Patent 4, 182,508, issued January 8, 1980 to Charles Kallai et al, which discloses a spring-loaded telescopic seat post for a bicycle seat. The seat post resiliently resists downward movement to act as a cushion for the bicycle seat.

U.S. Patent 3,989,263, issued November 2, 1976 to Gregory A. Stuck et al, discloses a seating arrangement which is intended to provide shock absorption and reduced chafing. Gregory et al discloses a telescopic shock-absorbing seat post with a flat spring attached between the rear of the seat and the top of the seat post. The flat spring offers little resistance to the up and down movement of the seat, which is cushioned by a compression spring

within the frame, but resiliently dampens lateral pivoting movement of the seat. In addition, the bottom of the seat post engages the compression spring in such a way that rotation of the seat, and with it the seat post, will apply torsion to the compression spring. Hence, the compression spring also will resist resiliently, lateral pivoting of the seat. Gregory et al states that rotation can range up to 40 to 50 degrees either side of the straight ahead position, but that it is preferably to limit rotation to about midway between those extremes. Such a degree of movement, and resilient resistance to the lateral movement, are unnecessary and indeed undesirable. Moreover, Gregory et al's seating arrangement is mechanically complex and would be expensive to make, requiring, as it does, ball bearings and hardened seat post and tubing components.

The present inventor's U.S. Patent 5,062,617, issued November 5, 1991, discloses an improved design of shock-absorbing seat post.

Thus, although the various seats, supports and seat posts discussed above seek to improve rider comfort, none of them can be considered to address satisfactorily all the aforementioned sources of discomfort, while being relatively economical to manufacture.

One object of the present invention is to provide a seat for pedal-powered and some motor-powered vehicles which overcomes or at least mitigates the deficiencies of these known seating arrangements. A second object of the invention is to provide a seat post which permits 2 inches of shock-absorbing vertical travel. The seat post may allow a degree of lateral pivoting movement, if desired.

SUMMARY OF THE INVENTION

According to one aspect of the present invention, a seat for a bicycle or other pedal-powered contrivance comprises a unitary saddle member generally T-shaped in

plan comprising a pair of symmetrical wing portions extending laterally from respective sides of a medial portion and a pommel portion extending forwardly from said medial, means depending from the underside of the seat for attaching the seat to a seat post or other support, the wing portions being supported as cantilevers by said medial portion and curving upwards such that their respective distal ends are significantly higher than the medial portion, upper faces of the wing portions and medial portion defining a concave seating surface, each wing portion being resiliently flexible to such a degree as to assume a substantially horizontal position under the weight of the rider.

In preferred embodiments, the medial portion is substantially thicker than the wing portions and serves as an anchorage for a mounting bracket. The degree of flexibility of the wing portions may decrease gradually towards the tips of the wing portions. This may be achieved by reducing the thickness of the wing portions, i.e., tapering, or by reinforcing ribs, or any other suitable means.

The leading edge of each wing portion may be swept back; the leading edge may be rounded.

Because the seating surface is concave, the rider sits "in" the seat and lateral forces are borne by the wing portions. Hence, pressure is not limited to the inside of the thighs and sphincter regions, but is distributed across the buttocks. Since lateral support is provided by the upwardly-curved wing portions, the pommel may be gradually raised to prevent forward slipping.

The flexible wing portions provide for a greater degree of comfort because they do not concentrate the weight of the rider in one localized area of the crotch but distribute it across the buttocks. At the same time, however, they do not significantly inhibit movement of the buttocks and upper thighs as the rider pedals.

The mounting bracket means may comprise a wire support moulded directly into the medial portion or the medial portion and the pommel portion, advantageously during manufacture.

In a further embodiment, the saddle differs in the fact that two polymer shock absorbers are incorporated into the design to further insulate the rider from road vibration. The front of the mounting rails fit as they would in a conventional seat, while the rear of the rails mount over barrel-shaped polymer insulators, secured into the base of the seat itself using carriage bolts. The bolts extend upwards into the saddle rear through the centre line of the polymer shock mounts. When weight is applied to the seat, the polymer mounts are compressed to absorb some of this movement. The heads of the bolts are free to move downward through the ends of the seat rails as the seat mounts compress.

As the bicycle rider's weight is applied and removed from the seat when travelling over rough terrain, the rear of the saddle flexes down and the polymer devices compress. The combined effect of this seat flex and polymer compression lends even more shock absorption to this model. The use of preferred titanium seat rails will serve to reduce overall unit weight while maintaining strength.

Both embodiments of saddle function most effectivaly when used in conjunction with a seat post shock absorber. The operation of this combination is as follows. As a large bump is encountered by the cycle, the frame accelerates rapidly upwards. The seat post shock absorber spring compresses, absorbing the major portion of this movement, while the seat wings flex downwards to absorb a portion. The bike frame gradually loads up as the weight of the rider is re-applied as he descends. The wings of the seat gradually return to their normal position

influenced now by the weight of the rider but not the bumps.

According to this aspect of the invention, there is provided a seat assembly for a bicycle or other pedal-powered contrivance, the assembly comprising a unitary saddle member comprising a pair of symmetrical wing portions extending laterally from respective sides of a medial portion, and a pommel or tongue portion extending forwardly from the medial portion, mounting means depending from the underside of the saddle member for attaching the seat to a seat post or other support, the wing portions curving upwards such that their respective distal ends are significantly higher than the medial portion, each wing portion being resiliently flexible to such a degree as to flex towards a substantially flat position under the weight of a rider, a shock absorbing support post for the saddle member, the post comprising a tubular member having top and bottom ends, shock absorbing means within the tubular member, an elongated cylindrical stem partially within and in sliding engagement with the tubular member, a first end of the stem engaging the shock absorbing means and a second end of the stem extending outwardly of the tubular member, and means permitting a predetermined range of free rotation of the stem in the tubular member.

In a further aspect of the invention, there is provided a shock absorbing support post for a cycle member, the support post comprising a tubular member having top and bottom ends, shock absorbing means within the tubular member, an elongated cylindrical stem partially within and in sliding engagement with the tubular member, a first end of the stem engaging the shock absorbing means and a second end of the stem extending outwardly of the tubular member, and means permitting a predetermined range of free rotation of the stem in the tubular member.

In preferred embodiments, the key is configured to permit rotation movement up to 5 degrees either side of a straight ahead position.

The keyway may be simply a flat in or on the shaft, and the key have a pair of mutually sloping surfaces, the ridge between the surfaces extending longitudinally of the shaft.

Such a seating arrangement, which permits free movement of the seat by only a few degrees either side of the medial position, has been found to give sufficient movement to reduce chafing. Greater degrees of movement are likely to add to instability. It has also been found that the movement need not be against a spring since normal pedalling action is unlikely to require the seat to move any more than about 5 degrees.

The use of the seat assembly of the invention is synergistic and advantageous. Where a seat according to the aforementioned first aspect of the invention is employed with such a pivoting seat support, the forward-projecting pommel portion of the saddle member preferably is relatively short as compared with conventional cycle seats used for touring. The flexing of the wing portions combines with the swivelling of the seat to provide a desired freedom of movement of the upper back of the thigh while reducing chafing and assists the swivelling action as the associated leg forces the pedal downwards. The effect may be enhanced when the leading edges of the wing portions are backswept.

The radical design of the seat has been adapted for commercial marketing by designing novelty soft rubber cushions, stylized to reflect themes and corporate logos. Examples of this marketing treatment include birds, dinosaurs, and adventure characters. These soft rubber covers are manufactured to slip over the existing seat.

The combination of flexing seat and seat post shock absorber comprises a new system that directly

addresses the concerns of comfort and health, as the compressive trauma to the rider's spine is greatly reduced.

BRIEF DESCRIPTION OF THE DRAWINGS

Embodiments of the invention will now be described, by way of example only, with reference to the accompanying drawings, in which:

Figure 1 is a side view of a seat according to the invention;

Figure 2 is a plan view of a seat according to the invention;

Figure 3 is a perspective view of a wire support rail for a seat according to the invention;

Figure 4 is a side view partly in section of the seat of Figure 1;

Figure 5 is a rear view partly in section of the seat of Figure 1;

Figure 6 is a perspective view of another seat according to the invention;

Figure 7 is a bottom view of the seat of Figure 6;

Figure 8 is a front view of the seat of Figure 6;

Figure 9 is a rear view of the seat of Figure 6 illustrating flexing of the seat;

Figure 10 is a side view in section of the seat of Figure 6;

Figure 11 is a side view of the seat of Figure 6 mounted on a seat post;

Figure 12 is a cross-sectional view taken on the longitudinal centre line of a telescopic seat post;

Figure 13 is a cross-section taken in the line A-A of Figure 12;

Figure 14 is a plan view of the key showing the inclination of its inclined surfaces;

Figure 15 is a perspective view of a key having a pair of mutually inclined surfaces for engaging in a keyway to secure the seat post; and

Figure 16 is an alternative key form having a flat surface.

While the invention will be described in conjunction with illustrated embodiments, it will be understood that it is not intended to limit the invention to such embodiments. One the contrary, it is intended to cover all alternatives, modifications and equivalents as may be included within the spirit and scope of the invention as defined by the appended claims.

DESCRIPTION OF PREFERRED EMBODIMENTS

In the drawings, similar features have been given similar reference numerals.

Referring to Figures 1 to 11, a seat 10 for use with a pedal-powered contrivance, such as a bicycle, comprises a unitary saddle member 11, conveniently a moulding of synthetic plastics material having characteristics which will be discussed in more detail later but which, combined with the geometric shaping of the seat member will provide a prescribed degree of resilient flexibility (see Figure 9). The saddle member 11 has a pair of wing portions 12 and 13, respectively, extending laterally one from each side of a medial region 14. A pommel or tongue portion 15 extends forwardly from the medial portion 14. The leading edges 16 and 17 of wing portions 12 and 13, respectively, are swept back, i.e. they curve outward and backwards from their junctions with the pommel or nose portion 15, i.e. they are swept backwards in a smooth curve. This downswept leading edge permits relatively unimpeded movement of the lower buttocks and upper thighs as the rider pedals. The medial portion 14 is

substantially thicker than the wing portions 12 and 13 and supports the seat when mounted onto a seat post.

The trailing edge 50 of said wing portions and 52 of said medial portions preferably extend in a smooth shallow arc from wing tip to wing tip.

The surfaces 60 and 62 of the wing portions 12 and 13, together with the medial portion 14, form a continuous smooth seating surface between the distal ends of the wings. The pommel 15 is raised gradually from the front of the medial portion 14 of the wings with highest point at front top 64 of pommel 15 to keep rider from sliding forward.

It has been found that depressions often provided for the buttocks create serious problems in that they cannot accommodate different sized riders nor changing positions of a single rider. Where the depressions do not fit properly or where a person changes position, pressure points are created. Accordingly, such areas are absent from the seat of the invention.

A mounting bracket comprising a wire support rail 18 is secured to the underside of the seat 10 preferably at rear portion 2 and pommel 15. Viewed from the bottom, as in Figure 3, the wire support rail 18 is substantially V-shaped.

The support rail 18 comprises rearwardly and downwardly extending parts 19 and 20, each of which includes a substantially horizontal part 21. At the front, the unitary end of the rail 18 is fitted into a hollow section 22.

In the embodiment of Figures 6 to 11, the rear ends of rails 19 and 20 are inserted into respective hollow sections 24. The hollow portions 22 and 24 are moulded into the saddle at the time of manufacturing. In assembly, the rear rail ends are placed into moulded holes 24 and the front of rail portion is pressed or snapped into place in cavity 22 by applying pressure to the rail front while the

seat is inverted. The rail front slides past a front rail holder into the cavity specifically shaped to hold rail 18 from coming back out. The entire mounting bracket 18 is made of a single piece of wire stock which is economical and simple to make.

The embodiment of Figures 1 to 5, as discussed in the Summary of the Invention above, utilizes a different rear attachment technique for the support rail 18. The horizontal parts 19 and 20 of rail 18 terminate in loops 70 and 72 respectively. The loops 70 and 72 are secured to the moulded studs 74 and 76 by carriage bolts 78 and 80 or the like fasteners. Between loops 70 and 72, and studs 74 and 76, are interposed polymer shock absorbers 82 and 84. As discussed above, the shock absorbers 82 and 84 compress beneath a rider's weight over rough terrain to provide additional cushioning. As the shock absorbers 82 and 84 compress, the carriage bolt head is free to move downward relative to loops 70 and 72.

The dimensions of the seat and the characteristics of the material from which it is made will determine the flexibility. It has been found that an injection moulded polymer composite is particularly suitable. The dimensions of the seat will vary depending upon the expected user. Thus, men, women and children's seats will likely differ in "wingspan" and flexibility. The relationships between these factors in a prototype seat were: Wingspan 28 cms. (preferred range 28 to 33 cms); mean width of wing portions 9 cms.; mean width of tongues or pommel 4.5 cm.; height of wing tip above medial surface 1.5 to 2.5 cm.; overall length of seat at pommel 12.5 cms. (preferred range 10 cm. to 15 cm.). A point load of about 65 Kg applied at a distance of about 9 cms. from the centre of the seat was sufficient to depress the wing portion until the seating surface was level. The same flexing was achieved with a point load of about 36 Kg applied at a distance of 14 cms. from the centre. For these tests two

thicknesses of KYDEX (prototype material only), each about 0.5 cms. thick, were used for the wing portions. The nose and medial portion were about 1 cm. thick.

When an injection mouldable material such as LEXAN FL910 is used, the seat may, if desired, be used without any covering, a suitable surface finish being provided by finishing the moulding tool appropriately. Alternatively, the moulded saddle member 11 may be covered with a fabric, for example LYCRA ™, perhaps with an interlining of neoprene rubber or other suitable cushioning material.

To produce the seat member 11, PU Foam is injected into the seat base in liquid form while the base is sitting in a bottom mould. The top mould is pressed over the foam to form the desired shape as the foam gels or cures.

It would be possible to form a suitable cushioning layer during moulding of the saddle member 11 by forming a foamed surface layer integral with the main body of the saddle member 11.

Referring to Figure 11, the seat 10 is mounted upon a shock absorbing seat post 28 in a conventional manner by means of a clamp 29 which has lugs engaging the horizontal bars 21 of rails 18 and 19; and a cylindrical tube clamp section clamped around a spigot 32 at the uppermost end of seat post 28. The seat post 28 will be mounted to the cycle by sliding tube 34 into the usual rear upright frame member (downtube) of a cycle (not shown) and securing it in a conventional manner which need not be described here.

The component parts of the seat post 28 are shown in more detail in Figures 12 to 16. (The seat post 28 is of the shock absorbing kind and is in part the subject of U.S. Patent 5,062,617.) The spigot 32 comprises the end of a composite cylindrical shaft 33 comprising an outer sleeve 33A made, conveniently, of aluminium alloy, for example,

and a core section 33B. The shaft 33 is slidable telescopically within a tube 34. Several inches of the shaft 33 protrude from the uppermost end of the tube 34 and are surrounded by a corrugated protective sleeve 35 of synthetic plastics material. The lowermost end of shaft 33 acts against one end of a compression spring 36 inside the tube 34. The other end of compression spring 36 acts against a slidable polymer dampener 37. The density of the polymer determines the amount of spring pressure required to start compression of the polymer. It is designed to compress as the spring 36 is almost fully compressed. The polymer will then serve to stop rebound of the spring (dampens rebound) and to soften spring bottom out, should that occur. The end of tube 34 is peened over as indicated at 38 to retain the plug 90 so that downwards forces on the seat post 33 are resiliently absorbed by compression of the compression spring 36. Plug 90 includes a threaded bore 92. An adjustment screw 94 extends through the threaded bore 92 in plug 90 and abuts against dampener 37. Adjustment of screw 94 then adjusts rest tension on spring 36.

The protruding upper portion of shaft 33 has a keyway 39 formed by a machined flat. When there is no load upon the shaft 33, the keyway 39 extends to a position just inside the tube 34. A key 40 is located in the keyway 39 by means of a machine screw 41 which extends through a hole 48 in the tube 34 where it overlaps the keyway 39. The screw 41 engages in a screw-threaded hole 42 in the key 40. As can be seen from Figures 13, 15, and 14, the key 40 comprises a segment of a cylinder of substantially the same diameter as shaft 33. The chordal surface of the key 40 comprises two flats 43 and 44, respectively, preferably inclined at an obtuse angle of about 170 degrees relative to each other. As shown in Figure 8, the flats 43 and 44 are symmetrical about the longitudinal centre line 45 of the key, corresponding to the centre of screw-

threaded hole 42. When the seat 10 is installed, the seat post 28 is adjusted so that, with the seat 10 in the straight ahead position, the key 40 is positioned as shown in Figure 13. In this position, the flats 43 and 44 subtend equal angles of 5 degrees with the adjacent surfaces of the juxtaposed flat surface of the keyway 39.

In use, therefore, the shaft 33, and hence the seat 10, can pivot freely up to 5 degrees each side of a central, straight-ahead position. This pivot function can also be attained by providing a key which is undersized. The flat of key 47 can have a tolerance space between key and keyway allowing an amount of pivot relevant to tolerance. 1 mm tolerance creates 5 degrees pivot. Such an arrangement allows the seat 10 to pivot to and fro as the rider pedals. As the left pedal descends, and the rider's left leg travels downwards, the force upon the left wing portion 13 will cause the seat to pivot slightly to the left. Conversely, when the right pedal descends, the seat 10 will pivot slightly to the right. It has been found that in practice the pedalling action usually causes the seat 10 to pivot less than 5 degrees. The flats 43 and 44 of key 40 serve as end stops to define the limits of such pivoting movement, but do not repeatedly strike the keyway, so wear caused by impact is not a concern.

It is proposed to supply the seat post 28 with an extra key 46. As shown in Figure 9, the key 46 is similar to key 40 but differs in that it does not have a pair of flats. Instead, it has a single flat 47 substantially equal in width to the flat surface of keyway 39 of the shaft 33. The extra key 46 could be substituted for the "pivoting" key 40 to facilitate the aligning of the seat post 28 and seat 10 or, if desired, to dispense with the pivoting action temporarily.

Keyway, keys and cap screw only keep stem 33 from exiting outer tube.

As discussed above, preload of spring and tension adjustment is by cap screw 94 threaded into bottom threaded plug 90 with the screw end coming up against a flat washer 96. Turning screw 94 clockwise pushes flat washer 96 up against polymer 37 and spring 36 increasing preload for desired spring resistance (soft or firm ride). A 0.5 mm tolerance is allowed between shaft 33 and inside of tube 34.

Delrin ™ sliders 49 and 51 are fitted into bottom end of shaft 33 and top of spring 36 respectively with a O tolerance to the inside of tube 34. This stops shaft from rubbing metal to metal as shaft moves in and out of tube. Delrin is an epoxy resin and self-lubricating and is commonly used between two moving metal surfaces. Due to the necessity to build 22 sizes of seat post outside diameters, the inside diameter must change 5 times from 25.4 mm to 31.8 mm. For the convenience of using the same spring for several groups of sizes a bottom spring centre along with top slider and spring centre keep spring from bowing under pressure and rubbing on tube inside diameters.

The combination of a swivelling seat post 28 and a seat 10 with flexible wing portions 12 and 13 significantly improves the comfort for the rider and reduces fatigue and soreness.

Thus it is apparent that there has been provided in accordance with the invention a seating arrangement for cycles, exercise cycles, other pedal-powered contrivances and the like contrivances that fully satisfies the objects, aims and advantages set forth above. While the invention has been described in conjunction with a specific embodiment/specific embodiments thereof, it is evident that many alternatives, modifications and variations will be apparent to those skilled in the art in light of the foregoing description. Accordingly, it is intended to embrace all such alternatives, modifications and variations as fall within the spirit and broad scope of the invention.

THE EMBODIMENTS OF THE INVENTION IN WHICH AN EXCLUSIVE PROPERTY OR PRIVILEGE IS CLAIMED ARE DEFINED AS FOLLOWS:

1. A seat for a bicycle or other pedal-powered contrivance, comprising:

a unitary saddle member comprising a pair of symmetrical wing portions extending laterally from respective sides of a medial portion, and a pommel or tongue portion extending forwardly from said medial portion; and

mounting means depending from the underside of said saddle member for attaching the seat to a seat post or other support;

said wing portions curving upwards such that their respective distal ends are significantly higher than the medial portion, each wing portion being resiliently flexible to such a degree as to flex toward a substantially flat position under the weight of a rider.

2. The seat of claim 1 wherein an upper surface of each said wing portion and of said medial portion form a continuous smooth seating surface between said distal ends of said wing portions.

3. The seat of claim 2 wherein said seating surface is substantially free of raised or depressed areas.

4. The seat of claim 3 wherein said seating surface is substantially flat along any front to rear line on said seating surface.

5. The seat of claim 4 wherein each said wing portion includes a leading edge curving rearwardly and outwardly from said pommel tongue portion.

6. The seat of claim 5 wherein a forward part of said upper surface of each said wing portion adjacent said leading edge is curved downwardly in an area intermediate said distal ends and said tongue portion.

7. The seat of claim 5 wherein a trailing edge of said wing portions and of said medial portion is defined by a shallow arc.

8. The seat of claim 7 wherein said shallow arc is continuous between the distal ends of said wing portions.

9. The seat of claim 1 wherein the distance between the distal ends of said wing portions is in the range of about 28 to 33 cm.

10. The seat of claim 9 wherein the length of said seat from a forward extremity of said pommel to a rear edge of said medial portion is in the range of 18.5 and 24.5 cms.

11. The seat of claim 10 wherein the distance front to rear of a medial part of each said wing is about 9 cms.

12. The seat of claim 11 wherein the distance from a leading edge of each said wing to said forward extremity of said tongue is in the range of about 10 to about 15 cm.

13. The seat of claim 12 wherein said tongue is arcuate at its forward end and has a maximum width of 4.5 cms.

14. A seat as claimed in claim 1, wherein said saddle member comprises a unitary moulding of synthetic plastics composite material.

15. The seat of claim 1 including, in addition, at least one polymer shock absorber interposed between said mounting means and a rear part of said saddle member.

16. The seat of claim 15 including two said polymer shock absorbers spaced respectively toward outer lateral edges of said medial portion.

17. The seat of claim 16 wherein said saddle portion includes a pair of depending studs to which said mounting means is secured for relative movement between said mounting means and said studs; and wherein said shock absorbers are located between said studs and said mounting means.

18. A seat assembly for a bicycle or other pedal-powered contrivance, said assembly comprising:

a unitary saddle member comprising a pair of symmetrical wing portions extending laterally from respective sides of a medial portion, and a tongue portion extending forwardly from said medial portion; and

mounting means depending from the underside of said saddle member for attaching the seat to a seat post or other support;

said wing portions curving upwards such that their respective distal ends are significantly higher than the medial portion, each wing portion being resiliently flexible to such a degree as to flex toward a substantially flat position under the weight of a rider; and

a shock absorbing support post for said saddle member, said post comprising:

a tubular member having top and bottom ends;

shock absorbing means within said tubular member;

an elongated cylindrical stem partially within and slidable within said tubular member, a first end of said stem engaging said shock absorbing means and a second end of said stem extending outwardly of said tubular member; and

means permitting a predetermined range of free rotation of said stem in said tubular member.

19. A shock absorbing support post for a cycle saddle member, said support post comprising:

a tubular member having top and bottom ends;

shock absorbing means within said tubular member;

an elongated cylindrical stem partially within and in sliding engagement with said tubular member, a first end of said stem engaging said shock absorbing means and a second end of said stem extending outwardly of said tubular member; and

means permitting a predetermined range of free rotation of said stem in said tubular member.

20. A shock absorbing support post for a seat comprising:

a tubular member having top and bottom ends;

shock absorbing means within said tubular member;

an elongated cylindrical stem partially within and in sliding engagement with said tubular member, a first end of said stem engaging said shock absorbing means and a second end of said stem extending outwardly of said tubular member;

means limiting the range of sliding movement of said stem longitudinally relative to said tubular member;

means permitting a predetermined range of free rotation of said stem in said tubular member;

means for maintaining a predetermined resting force between said stem and said shock absorbing means, said means limiting, said means permitting and said means

for maintaining comprising a longitudinally extending slot or keyway having upper and lower ends in said stem and a mating key in said tubular member, and wherein said key and said keyway are positioned such that said lower end of said keyway brings up against said key to thereby stop sliding movement on said stem at a point where said predetermined resting force exists between said shock absorbing means and said stem; and wherein the relative dimensions of said key and said keyway are chosen to define said predetermined range of free rotation.

21. The support post of claim 20 wherein said shock absorbing means is a compression spring.

22. The support of claim 20 wherein said shock absorbing means is a spring slidable within said tubular member and wherein said tubular member includes stop means preventing expulsion of said spring through said bottom end.

23. The support post of claim 22 wherein said stop means comprises at least partial closure of said bottom end of said tubular member.

24. A self-contained shock absorbing support post for replacing a conventional bicycle seat support post and comprising:

a tubular member having top and bottom ends and adapted to be inserted bottom end first into and secured within a conventional tubular bicycle frame;

shock absorbing means within and toward said bottom end of said tubular member;

an elongated cylindrical stem partially within and in sliding engagement with said tubular member, a first end of said stem engaging said shock absorbing means and a

second end of said stem extending outwardly of said top end of said tubular member for attachment to a bicycle seat;

means limiting the range of sliding movement of said stem longitudinally relative to said tubular member;

means permitting said stem against rotation in said tubular member; and

means for maintaining a predetermined resting force between said stem and said shock absorbing means, said means limiting, said means permitting, and said means for maintaining comprising a longitudinally extending slot or keyway having upper and lower ends in said stem and a mating key in said tubular member and wherein said key and said keyway are positioned such that said lower end of said keyway brings up against said key to whereby stop sliding movement of said stem at a point where said predetermined resting force exists between said shock absorbing means and said stem, and wherein the relative dimensions of said key and said keyway are chosen to define said predetermined range of free rotation.

25. The support post of claim 24 including stop means on said stem to limit the extent of entry of said tubular member into said bicycle frame.

26. The support post of claim 24 wherein said keyway comprises a flat area on said stem and said key comprises a contoured nut positioned for relative sliding movement on said flat area and contoured to allow said predetermined range of free rotation between said flat area and an adjacent face of said key, said key nut secured by a cap screw bolt extending radially through an opening in the sidewall of said tubular member.

27. The support post of claim 26 wherein said face of said key includes a central forwardly projecting ridge from which said surface tapers to outer edges of said key

forming first and second minor surfaces whereby said stem can rotate about said ridge between said first and second minor surfaces.

28. The support post of claim 27 wherein an opposite face of said key nut from said adjacent face is arcuate for engagement with an inner sidewall of said tubular member.

29. The support post of claim 24 wherein said key is a segment of a cylinder having a first arcuate face and a pair of flat faces projecting from said arcuate face, said flat faces subtending a predetermined angle therebetween, said arcuate surface engaging an inner wall of said tubular member, said angle providing a pivot line for rotation of said flat about said key and said flat surfaces providing limits to said rotation.

30. The support post of claim 26 wherein said sidewall includes at least two openings therethrough spaced longitudinally whereby said nut may be secured at different longitudinal positions of said tubular member.

31. The support post of claim 24 wherein said shock absorbing means is at least one compression spring.

32. The support post of claim 21 wherein said shock absorbing means comprises, in addition, a polymer dampener positioned below said spring.

33. The support post of claim 23 including a slidable polymer dampener between said bottom end and said spring.

34. The support post of claim 33 including a plug between said bottom end and said polymer dampener.

35. The support post of claim 34 wherein said plug includes a threaded bore therein and an adjustment screw in said bore whereby rotation of said screw changes the position of said dampener against said spring.

36. The support post of claim 35 including a plate member between said adjustment screw and said dampener.

37. The support post of claim 21 including a first centering slider in cooperative engagement with a lower end of said spring and a second centering slider in cooperative engagement between a lower end of said shaft and an upper end of said spring.

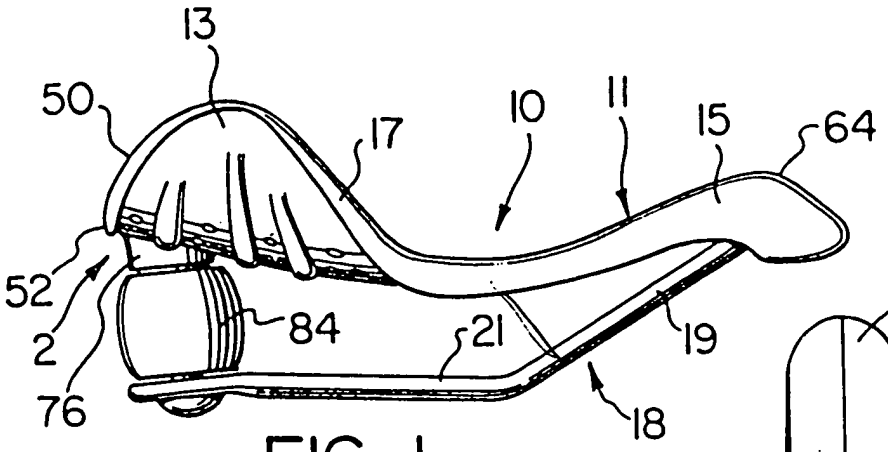


FIG. 1

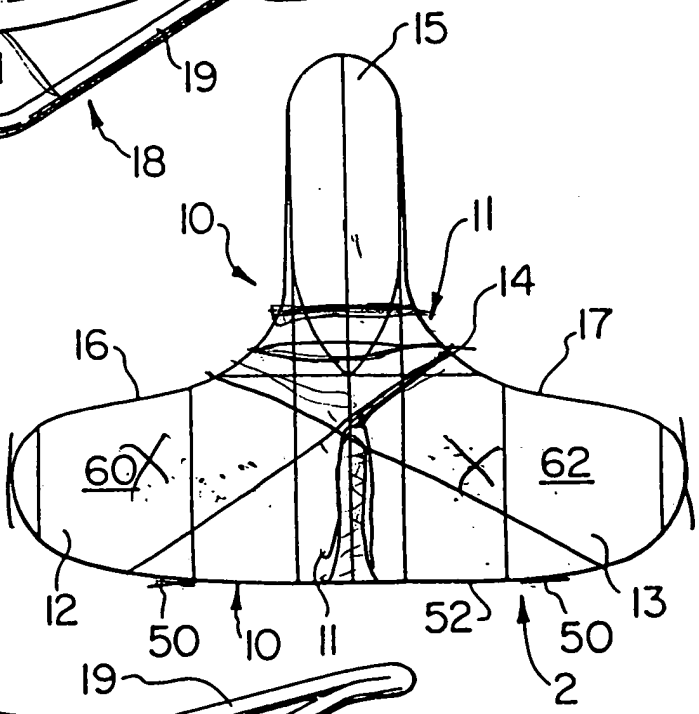


FIG. 2

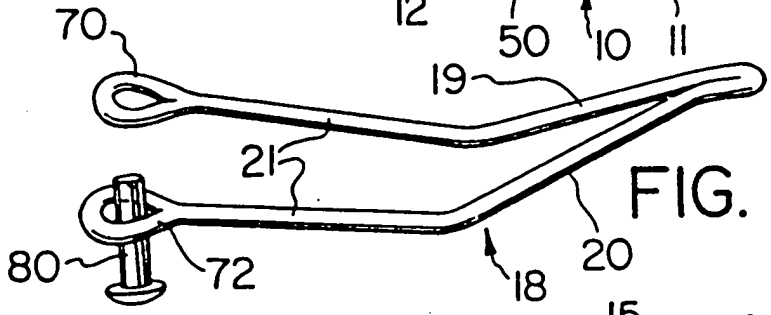


FIG. 3

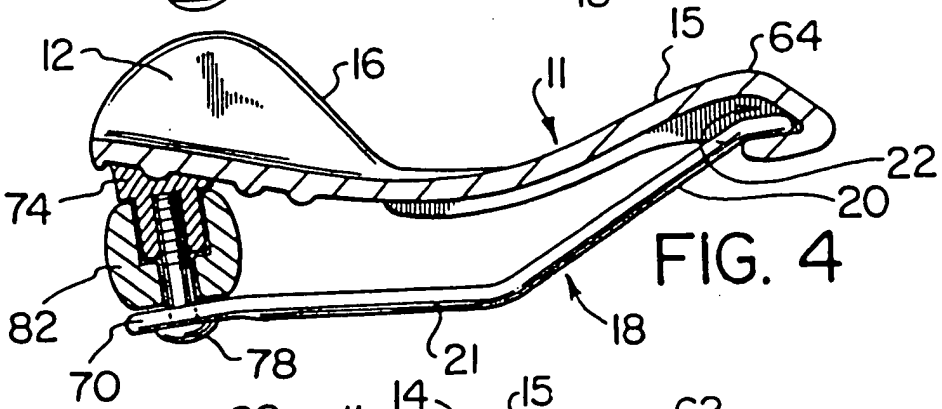


FIG. 4

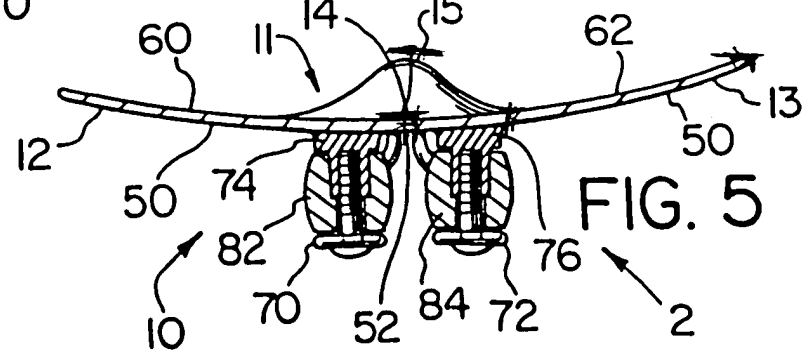


FIG. 5

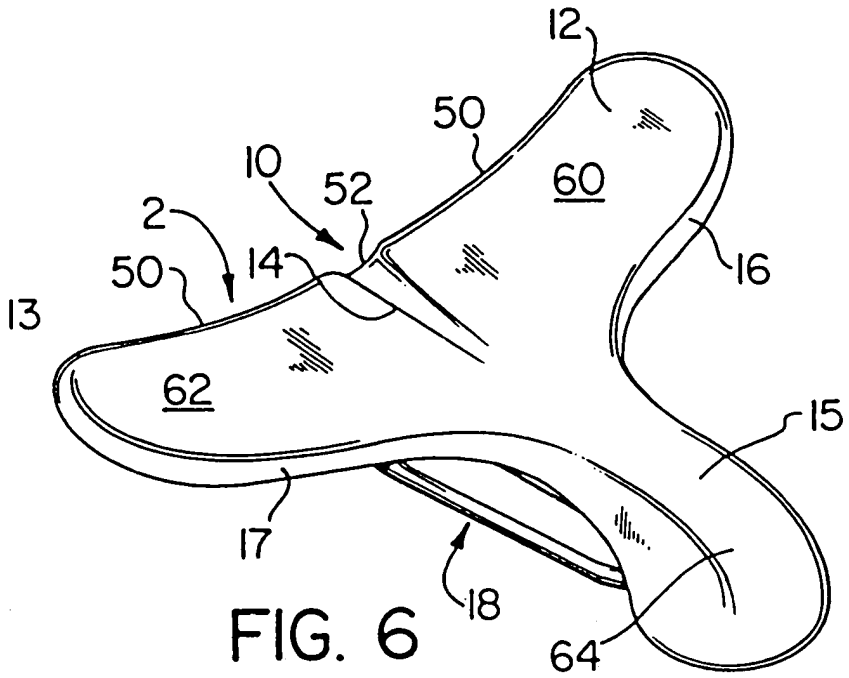

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FIG. 6

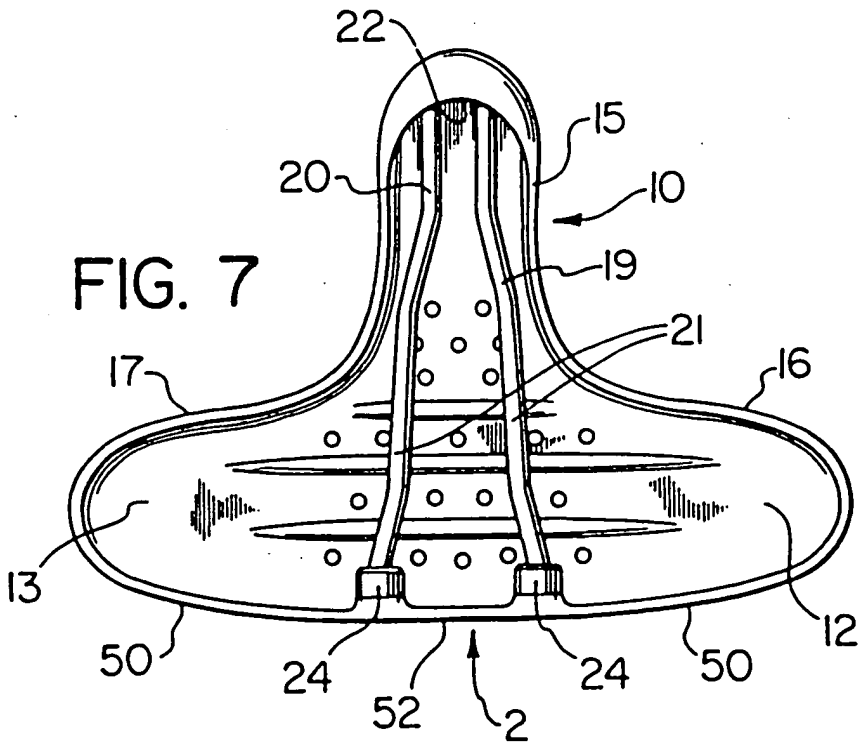
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FIG. 7

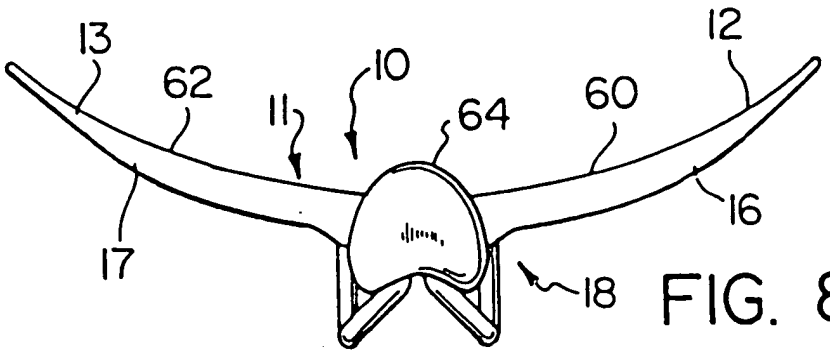

FIG. 8

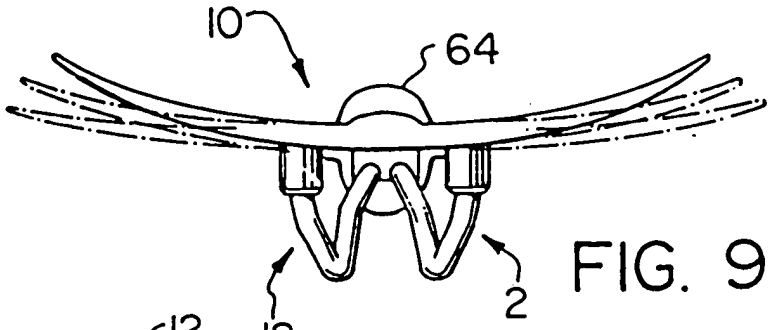

FIG. 9

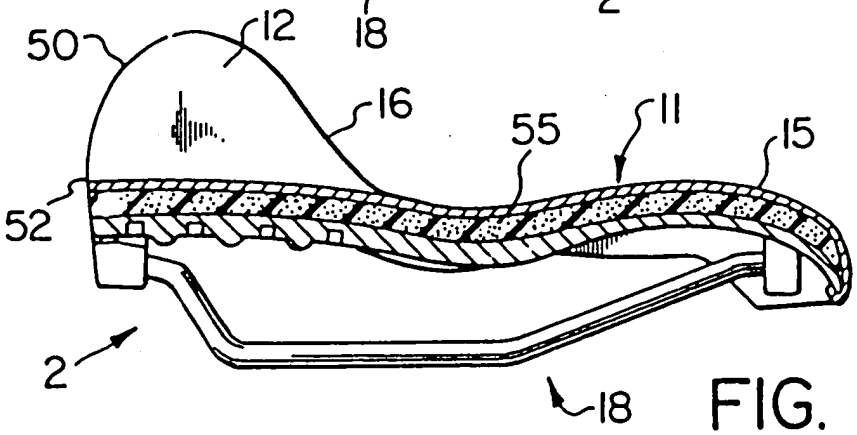

FIG. 10

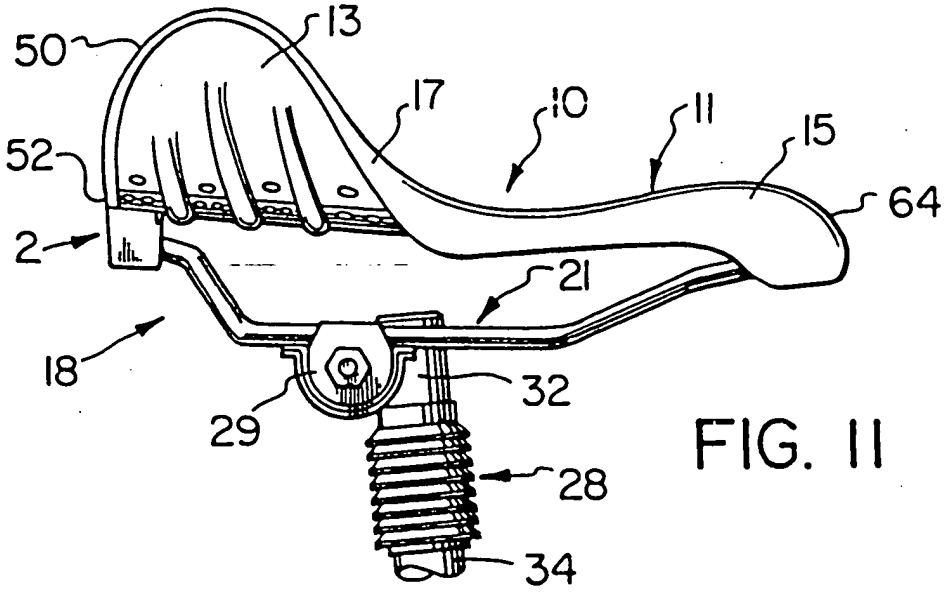

FIG. 11

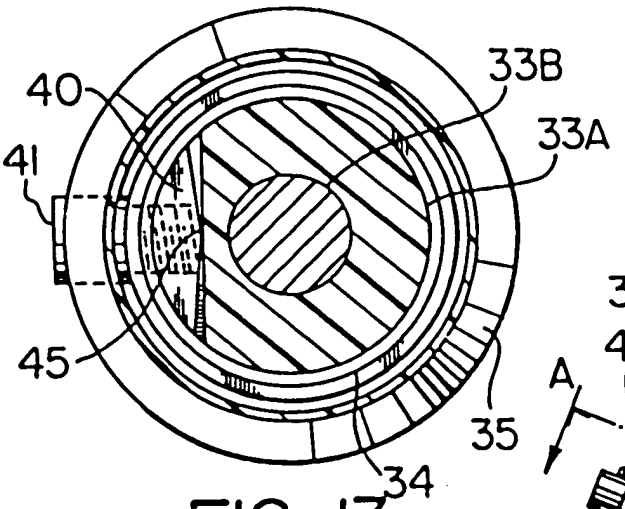

FIG. 13

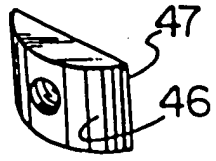

FIG. 16

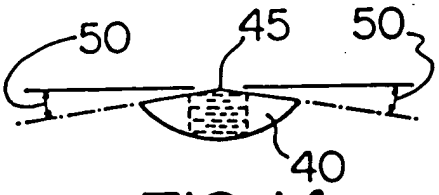

FIG. 14

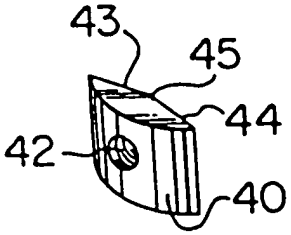

FIG. 15

FIG. 12